

PROCEEDINGS  
OF THE  
CALIFORNIA ACADEMY OF SCIENCES  
FOURTH SERIES

---

Festschrift for George Sprague Myers

---

Vol. XXXVIII, No. 13, pp. 265-272; 2 figs.; 3 tables. December 31, 1970

---

A NEW GYMNOTOID FISH FROM THE  
RIO TOCANTINS, BRAZIL

By

Maarten Korringa

*Division of Systematic Biology, Stanford University*

INTRODUCTION

Amongst the gymnotoids in the fish collection of the California Academy of Sciences in San Francisco, I found three unusual specimens which were collected in 1924 at Porto Nacional, Rio Tocantins, Brazil, by Dr. Carl Ternetz. According to the keys in Ellis (1913) and Schultz (1949), these specimens fall into the genus *Sternopygus*, but the unusual appearance of the new fish suggested that it might be different. Accordingly, the three specimens were radiographed, and, after morphometric data were taken, one was cleared and stained for osteological study. Although these fish superficially resemble *Sternopygus*, their affinities do not appear to lie with this genus. I believe that the species described below requires generic recognition. Osteological nomenclature follows Weitzman (1962).

ACKNOWLEDGMENTS

I am grateful to Dr. W. I. Follett and Mrs. Robert Dempster of the California Academy of Sciences in San Francisco for their kind assistance in obtaining study materials from the fish collection there. I am also indebted to Professor George S. Myers, Mr. Leonard Compagno, and Dr. Warren C. Freihofer for their encouragement and criticism of the work at various stages.

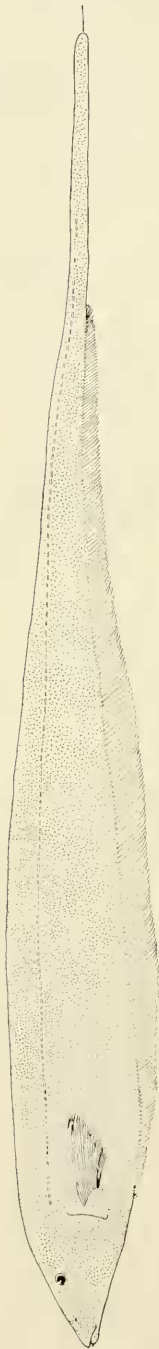


FIGURE 1. *Archolaemus blax*, holotype, CAS 24743. Total length 435 mm.

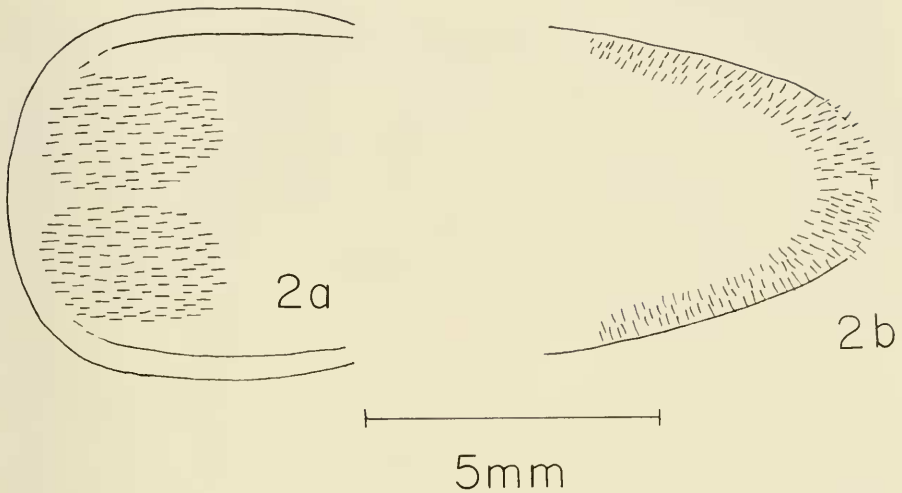


FIGURE 2. *Archolaemus blax*, holotype. View of jaws, indicating shape of tooth patches and showing mandibular teeth outside mouth. 2a. Upper jaw; 2b. lower jaw.

### *Archolaemus* Korringa, new genus

TYPE SPECIES. *Archolaemus blax* Korringa, new species.

Elongate compressed gymnotoid fishes, lacking caudal fin and dorsal thong. Frontal and parietal fontanel large. Tail extending beyond end of anal fin. Body completely covered with scales, with several rows of large scales near and below lateral line; back and lower parts of sides covered with very small scales. Head naked. Orbital margin free. Mesopterygoid with approximately 10 small villiform teeth. Premaxillaries and dentaries each carrying numerous villiform teeth in a single patch on each bone (see fig. 2); a number of dentary teeth are outside the mouth and project forward in larger specimens. Premaxillaries small, about one and one-half times as long as wide, about one-fourth as long as the maxillaries. Maxillaries more or less straight, virtually parallel to the body length of the fish. Branchiostegal rays 5, 4 on ceratohyal, 1 on epihyal. Posterior process of the lower pharyngeal bones with a patch of approximately 12 teeth. The upper pharyngeals each with a patch of about 8 teeth. In both upper and lower pharyngeals these teeth are small and villiform. Mesocoracoid absent.

Certain lateral line canals of the head are much larger in diameter than others, and larger even than the canal of the body. Especially prominent are the nasal-supraorbital canal (anterior to the eyes), the infraorbital canal (excepting the posterior 2 bones, which are of small diameter), and the preopercular-mandibular canal. In conjunction with this increase in diameter, there is a progressive reduction of the superficial walls of the canals, so that they resemble troughs roofed over by arches.

TABLE 1. *Measurements in millimeters. Figures in parentheses are measurements expressed as percentage of the distance from tip of snout to end of anal fin base.*

	<i>Holotype</i> CAS 24743		<i>Paratype</i> CAS 24744		<i>Paratype</i> CAS 24745	
Total length	435	(127)	313	(124)	235	(137)
Snout tip to end of anal fin	344	(100)	253	(100)	172	(100)
Snout tip to origin of anal fin	46	(13.4)	45	(17.8)	26.5	(15.4)
Longest anal fin ray	16.5	(4.8)	14.5	(5.7)	8.5	(4.9)
Snout tip to vent	23	(6.7)	18	(7.1)	17	(9.9)
Snout tip to occiput	33.5	(9.7)	30	(11.9)	20	(11.6)
Snout tip to pectoral fin origin	47	(13.7)	45	(17.8)	25.5	(14.8)
Length of pectoral fin base	8	(2.3)	6.5	(2.6)	3.5	(2.0)
Snout tip to tip of pectoral fin	75.5	(21.9)	71	(28.1)	42	(24.4)
Snout tip to anterior margin of eye	19	(5.5)	18	(7.1)	11	(6.4)
Snout tip to rictus <sup>1</sup>	6	(1.7)	—	—	3.5	(2.0)
Snout tip to posterior edge of opercle	43.5	(12.7)	40	(15.8)	23	(13.4)
Snout tip to anterior nostril <sup>1</sup>	4.3	(1.3)	—	—	2.7	(1.6)
Posterior nostril to eye	13.5	(3.9)	11.5	(4.5)	6	(3.5)
Distance between orbital margins	4.5	(1.3)	3	(1.2)	2.6	(1.5)
Depth at eye	22.5	(6.5)	19	(7.5)	12.5	(7.3)
Depth at occiput	29	(8.5)	25	(9.9)	15.5	(9.0)
Maximum depth of body <sup>2</sup>	40.5	(11.8)	40	(15.8)	19.5	(11.3)
Width of mouth	6	(1.7)	5.5	(2.2)	2.7	(1.6)
Width of head at eye	13.5	(3.9)	11	(4.3)	6	(3.5)
Width of head at occiput	15.5	(4.5)	14	(5.5)	9	(5.2)
Anal fin rays	218		202		202	
Pectoral fin rays, right side	19		20		20	
Pectoral fin rays, left side	19		20		19	
Lateral line scales <sup>3</sup>	137		143		146	
Abdominal vertebrae	15		14		14	
Caudal vertebrae	59		51		75	

<sup>1</sup> Snout of this specimen too severely damaged to take accurate measurements.

<sup>2</sup> Maximum depth of body is approximately at tip of pectoral fins.

<sup>3</sup> Counted between dorsal margin of gill opening and end of anal fin base.

Abdominal vertebrae 14 or 15; caudal vertebrae 51 to 75 in the three specimens; actual range doubtless greater. Two pyloric caeca present. Vent and genital papilla lie directly below the eye. Snout moderately long, conical; distance from snout tip to eye approximately equal to distance from eye to posterior margin of opercle.

### **Archolaemus blax** Korringa, new species.

(Figures 1, 2.)

STUDY MATERIAL. Three specimens. Holotype: CAS 24743, male; 435 mm. in total length; Porto Nacional, Rio Tocantins, Estado de Goiás, Brazil; collected by Carl Ternetz, February 8, 1924. Paratypes: CAS 24744, female full of eggs,

313 mm.; and CAS 24745, 235 mm. (cleared and stained with alizarin, in glycerine), both collected with the holotype.

DESCRIPTION. See table 1 for counts and measurements. Dorsal profile of head straight; ventral profile slightly convex to slightly concave. Tail somewhat flattened and ribbonlike (this may be an artifact, as all the tails possess, instead of vertebrae, a slender flexible rod, indicating that regeneration has taken place). One paratype (CAS 24744) is a ripe female; the eggs are slightly ovoid, about 1.5 mm. in length. The first gill arch of the right side possesses 7 to 10 nubbins representing rakers (9 in holotype, 10 and 7 in paratypes). In *Sternopygus* each nubbin has imbedded in it a number of very small spines or teeth. I have not been able to determine if this is true for *Archolaemus*, as the spines or teeth are not present in the cleared and stained specimens.

Color in alcohol an even tan; area around orbital margin and tip of snout pale. There is no evidence of the dark brown banding found in many gymnotoids.

ORIGIN OF NAME. Greek, *archos*, anus; *laimos*, throat, from the location of the vent under the eye; Latin, *blax*, doltish, in reference to the fish's general appearance.

#### DISCUSSION

Regan (1911) places all short-snouted gymnotoids with frontal and parietal fontanels, but lacking caudal fins and dorsal thongs, in the subfamily Sternopyginae of his family Sternarchidae (properly Apteronotidae). I assigned *Archolaemus* to this subfamily on the basis of 1) absence of mesocoracoid, 2) presence of large fontanels, 3) absence of caudal fin and dorsal thongs, 4) presence of mesopterygoid teeth. *Sternopygus* and *Archolaemus* are the only members of the subfamily with a free orbital margin. However, *Archolaemus* is distinct from *Sternopygus* in several ways. *Sternopygus* has a pectoral girdle with a short suture between the coracoid and the scapula, the scapular foramen being open anteriorly. In *Archolaemus*, the suture between the two bones is considerably longer, and a distinct scapular foramen is present. The former type, as Regan points out, is found in *Steatogenys*, whereas the latter is characteristic of *Eigenmannia*. The pectoral girdle of *Hypopomus* resembles that of *Eigenmannia* and *Archolaemus* in possessing a long suture, but lacks a conspicuous scapular foramen. *Archolaemus* is further distinguished in having the anus and genital papilla directly below the eye; in all specimens of *Sternopygus* examined, these were well posterior to the eye. The eye of *Archolaemus* is considerably larger (about 4.5 to 5.5 times in the distance between the eye and the posterior margin of the opercle) than that of *Sternopygus* (6.5 to 11). Other distinguishing features are: premaxillaries small, about one-fourth the length of the maxillaries; as opposed to slightly over one-half in *S. macrurus*; few anal rays, generally less than 220, whereas *Sternopygus* has 234 to 320 (counts between 260 and 280 are typical). The maxillaries are fairly long and almost horizontal,

whereas *Sternopygus* has oblique maxillaries. The body cavity of *Archolaemus* is short (6.3 to 8.3 times in length to end of anal fin base), and few (14 to 15) abdominal centra are present; *Sternopygus* has a longer body cavity (about 3.5 to 5 times in length to end of anal fin base) and more abdominal centra (generally 20 to 25). *Archolaemus* has a much longer snout than *Sternopygus*, the distance from snout tip to eye being about 1.2 times the distance from eye to occiput, as opposed to 0.7 for the latter genus.

*Archolaemus blax* is distinguished from all species of *Eigenmannia* by the presence of a free orbital margin. Except for *E. virescens*, no species of *Eigenmannia* that I have examined has the vent as far forward as the eye. *Archolaemus* has a significantly longer snout than does *Eigenmannia*; snout tip to center of eye is contained 13 to 16 times in the length to the end of anal fin base in the former, 20 to 28 times in members of the latter genus. *Archolaemus* has a long maxillary disposed almost parallel to the body length, whereas the maxillaries of *Eigenmannia* are much shorter and vary from  $45^\circ$  to perpendicular to the body length. *Archolaemus* appears to have a proportionately longer gape than *Eigenmannia*. No specimen of *Eigenmannia* that I have examined has teeth outside the mouth.

*Rhabdolichops* (Eigenmann and Allen, 1942) is distinguished from *Archolaemus* principally by its squamation, gill rakers, and general body shape. The back of *Rhabdolichops* is naked to a point about two-thirds of the distance to the end of the anal; anteriorly, the entire region above the lateral line is naked; posteriorly, only the top of the back. The body of *Archolaemus* is entirely covered with scales. *Rhabdolichops* has long, well developed gill rakers, a short snout, and a concave upper head profile. I do not yet have osteological material of this genus and therefore am not certain of its affinities.

The edentulous Steropyginae (*Hypopomus*, *Steatogenys*, and *Parupygus*) appear to be highly distinct from the foregoing genera. Most notably, *Archolaemus*, *Sternopygus*, *Eigenmannia*, and *Rhabdolichops* have similar lateral line canals while in *Steatogenys*, *Hypopomus*, and *Parupygus* (Hoedeman, 1962) all the canals are tubelike and of small diameter. The circumorbital tubes lack platelike stays. Many of the canals seem to be isolated from the bones with which they are normally associated in other groups of fishes; e.g., there is no apparent bony connection between the dentary and the chain of tubules lying ventral to it. Furthermore, these 3 genera lack teeth on the premaxillaries, dentaries, and mesopterygoids and not one has a long snout. *Archolaemus* further differs from *Steatogenys* in the absence of "mental filaments" and lacks the banded color pattern found in this genus and in some species of *Hypopomus*.

#### COMPARATIVE MATERIAL EXAMINED

*Sternopygus macrurus* (Bloch and Schneider): SU 21997, 2 specimens, Botanic Garden, British Guiana. *Eigenmannia virescens* (Valenciennes): SU

54508, 2 specimens, Lagoa Grande, Brazil. *Eigenmannia macrops* (Boulenger): SU 54473, 2 specimens, São Gabriel Rapids, Rio Negro, Brazil. *Eigenmannia conirostris* Eigenmann and Allen: SU 54461, 1 specimen, Lagoa Grande, Lower Amazon, Brazil, in alcohol. *Rhabdolichops longicaudatus* Eigenmann and Allen: SU 54377, 1 specimen, Santerém, Amazon, Brazil; SU 64076, 1 specimen, Cucuhy, Rio Negro, Brazil; both in alcohol. *Hypopomus brevirostris* (Steindachner): SU 24769, 1 specimen, Lago Gatún, Three Rivers Plantation, Panamá. *Steatogenys elegans* (Steindachner): SU 22445, 2 specimens, Belém do Pará, Brazil. *Parupygus savanensis* Hoedeman: Zoological Museum of Amsterdam 106,074, 1 specimen, Botopasi, Surinam River, Surinam. Except as noted, all are alizarin preparations in glycerine.

### SUMMARY

*Archolaemus blax* Korrिंगa, a new genus and species of gymnotoid fish is described. It is one of the toothed Sternopyginae, a group consisting of *Sternopygus*, *Eigenmannia*, and *Rhabdolichops*. These are united by the possession of hypertrophied lateral line canal bones in the head. *Archolaemus* shares many characters with *Sternopygus* and *Eigenmannia*, though its affinities lie more with the latter.

### LITERATURE CITED

- EIGENMANN, C. H., AND W. R. ALLEN  
 1942. Fishes of Western South America. Lexington, Kentucky, xv + 494 pp., 22 pls., 1 map.
- ELLIS, M. M.  
 1913. The gymnotoid eels of tropical America. *Memoirs of the Carnegie Museum*, vol. 6, no. 3, pp. 109-204, pl. 19-23.
- HOEDEMAN, J. J.  
 1962. Notes on the ichthyology of Surinam and other Guianas, 9. New records of gymnotoid fishes. *Bulletin of Aquatic Biology*, vol. 3, no. 26, pp. 53-60.
- REGAN, C. T.  
 1911. The classification of the teleostean fishes of the order Ostariophysi, 1. Cyprinoidae, *Annals and Magazine of Natural History*, ser. 8, vol. 8, no. 43, pp. 13-31, pl. 2.
- SCHULTZ, L. P.  
 1949. A further contribution to the ichthyology of Venezuela. *Proceedings of the United States National Museum*, vol. 99, pp. 1-211, pl. 1-3.
- WEITZMAN, S. H.  
 1962. The osteology of *Brycon meeki*, a generalized characid fish, with an osteological definition of the family. *Stanford Ichthyological Bulletin*, vol. 8, no. 1, pp. 1-77.